

Abstract of the Disclosure

A method for forming a device isolation film of a semiconductor device, wherein an annealing process is performed on the oxide film using NH_3 prior to the deposition of a liner nitride film and after the deposition of a thermal oxide film on a sidewall of a trench to nitridate the oxide film is disclosed. The method comprises the steps of: (a) sequentially forming a pad oxide film and a pad nitride film on a semiconductor substrate; (b) selectively etching the pad nitride film to form a nitride film pattern; (c) etching the pad oxide film and a predetermined thickness of the semiconductor substrate using the nitride film pattern as a hard mask to form a trench; (d) forming a thermal oxide film on the surface of the trench; (e) performing an annealing process under NH_3 atmosphere to form an oxide nitride film on the surface of the thermal oxide film; (f) forming a liner nitride film on the entire surface; (g) forming an oxide film filling the trench on the entire surface; and (h) performing a planarization process.